The Price Effects of a Tariff: A Simple Dynamic Story

For an intuitive explanation about why these price changes would likely occur in a real-world setting, read the following story about the likely dynamic adjustment process. Technically, this story is *not* a part of the partial equilibrium model, which is a static model that does not contain adjustment dynamics. However, it is worthwhile to think about how a real market adjusts to the equilibria described in these simple models.

Suppose the United States and Mexico are initially in a free trade equilibrium. Mexico imports wheat at the free trade price of $10 per bushel. Imagine that the market for unprocessed wheat in both the United States and Mexico is located in a warehouse in each country. Each morning, wheat arrives from the suppliers and is placed in the warehouse for sale. During the day, consumers of unprocessed wheat arrive to buy the supply. For simplicity, assume there is no service charge collected by the intermediary that runs the warehouses. Thus, for each bushel sold, $10 passes from the consumer directly to the producer.

Each day, the wheat market clears in the United States and Mexico at the price of $10. This means that the quantity of wheat supplied at the beginning of the day is equal to the quantity purchased by consumers during the day. Supply equals demand in each market at the free trade price of $10.

Now suppose that Mexico places a $2 specific tariff on imports of wheat. Let's assume that the agents in the model react slowly and rather naively to the change. Let's also suppose that the $2 tariff is a complete surprise.

Each day, prior to the tariff, trucks carrying U.S. wheat would cross the Mexican border in the wee hours, unencumbered, en route to the Mexican wheat market. On the day the tariff is imposed, the trucks are stopped and inspected. The drivers are informed that they must pay $2 for each bushel that crosses into Mexico.

Suppose the U.S. exporters of wheat naively pay the tax and ship the same number of bushels to the Mexican market that day. However, to recoup their losses, they raise the price by the full $2. The wheat for sale in Mexico now is separated into two groups. The imported U.S. wheat now has a price tag of $12, while the Mexican-supplied wheat retains the $10 price. Mexican consumers now face a choice. However, since Mexican and U.S. wheat are homogeneous, the choice is simple. Every Mexican consumer will want to purchase the Mexican wheat at $10. No one will want the U.S. wheat. Of course, sometime during the day, Mexican wheat will run out and consumers will either have to buy the more expensive wheat or wait till the next day. Thus some $12 U.S. wheat will sell, but not the full amount supplied. At the end of the day, a surplus will remain. This means that there will be an excess demand for Mexican wheat and an excess supply of U.S. wheat in the Mexican market.

Mexican producers of wheat will quickly realize that they can supply more to the market and raise their price. A higher price is possible because the competition is now charging $12. The higher supply and higher price will raise the profitability of the domestic wheat producers. (Note that the supply of wheat may not rise quickly since it is grown over an annual cycle. However, the supply of a different type of good could be raised rapidly. The length of this adjustment will depend on the nature of the product.) U.S. exporters will quickly realize that no one wants to buy their wheat at a price of $12. Their response will be to reduce export supply and lower their price in the Mexican market.

As time passes, in the Mexican market, the price of Mexican-supplied wheat will rise from $10 and the price of U.S. supplied wheat will fall from $12 until the two prices meet somewhere in between. The homogeneity of the goods requires that if both goods are to be sold in the Mexican market, then they must sell at the same price in equilibrium.

As these changes take place in the Mexican market, other changes occur in the U.S. market. When U.S. exporters of wheat begin to sell less in Mexico, that excess supply is

shifted back to the U.S. market. The warehouse in the United States begins to fill up with more wheat than U.S. consumers are willing to buy at the initial price of $10. Thus at the end of each day, wheat supplies remain unsold. An inventory begins to pile up. Producers realize that the only way to unload the excess wheat is to cut the price. Thus the price falls in the U.S. market. At lower prices, though, U.S. producers are willing to supply less, thus production is cut back as well.

In the end, the U.S. price falls and the Mexican price rises until the two prices differ by $2, the amount of the tariff. A Mexican price of $11.50 and a U.S. price of $9.50 is one possibility. A Mexican price of $11 and a U.S. price of $9 is another. U.S. producers now receive the same lower price for wheat whether they sell in the United States or Mexico. The exported wheat is sold at the higher Mexican price, but $2 per bushel is paid to the Mexican government as tariff revenue. Thus U.S. exporters receive the U.S. price for the wheat sold in Mexico.

The higher price in Mexico raises domestic supply and reduces domestic demand, thus reducing their demand for imports. The lower price in the United States reduces U.S. supply, raises U.S. demand, and thus lowers U.S. export supply to Mexico. In a two-country world, the $2 price differential that arises must be such that U.S. export supply equals Mexican import demand.

Noteworthy Price Effects of a Tariff

Two of the effects of a tariff are worthy of emphasis. First, although a tariff represents a tax placed solely on imported goods, the domestic price of both imported and domestically produced goods will rise. In other words, a tariff will cause local producers of the product to raise their prices. Why?

In the model, it is assumed that domestic goods are perfectly substitutable for imported goods (i.e., the goods are homogeneous). When the price of imported goods rises due to the tariff, consumers will shift their demand from foreign to domestic suppliers. The

extra demand will allow domestic producers an opportunity to raise output and prices to clear the market. In so doing, they will also raise their profit. Thus as long as domestic goods are substitutable for imports and as long as the domestic firms are profit seekers, the price of the domestically produced goods will rise along with the import price.

The average consumer may not recognize this rather obvious point. For example, suppose the United States places a tariff on imported automobiles. Consumers of U.S.-made automobiles may fail to realize that they are likely to be affected. After all, they might reason, the tax is placed only on imported automobiles. Surely this would raise the imports' prices and hurt consumers of foreign cars, but why would that affect the price of U.S. cars? The reason, of course, is that the import car market and the domestic car market are interconnected. Indeed, the only way U.S.-made car prices would not be affected by the tariff is if consumers were completely unwilling to substitute U.S. cars for imported cars *or* if U.S. automakers were unwilling to take advantage of a profit-raising possibility. These conditions are probably unlikely in most markets around the world.

The second interesting price effect arises because the importing country is large. When a large importing country places a tariff on an imported product, it will cause *the foreign price to fall*. The reason? The tariff will reduce imports into the domestic country, and since its imports represent a sizeable proportion of the world market, world demand for the product will fall. The reduction in demand will force profit-seeking firms in the rest of the world to lower output and price in order to clear the market.

The effect on the foreign price is sometimes called the terms of trade effect. The terms of trade is sometimes defined as the price of a country's *export goods* divided by the price of its *import goods*. Here, since the importing country's import good will fall in price, the country's terms of trade will rise. Thus a tariff implemented by a large country will cause an improvement in the country's terms of trade.